

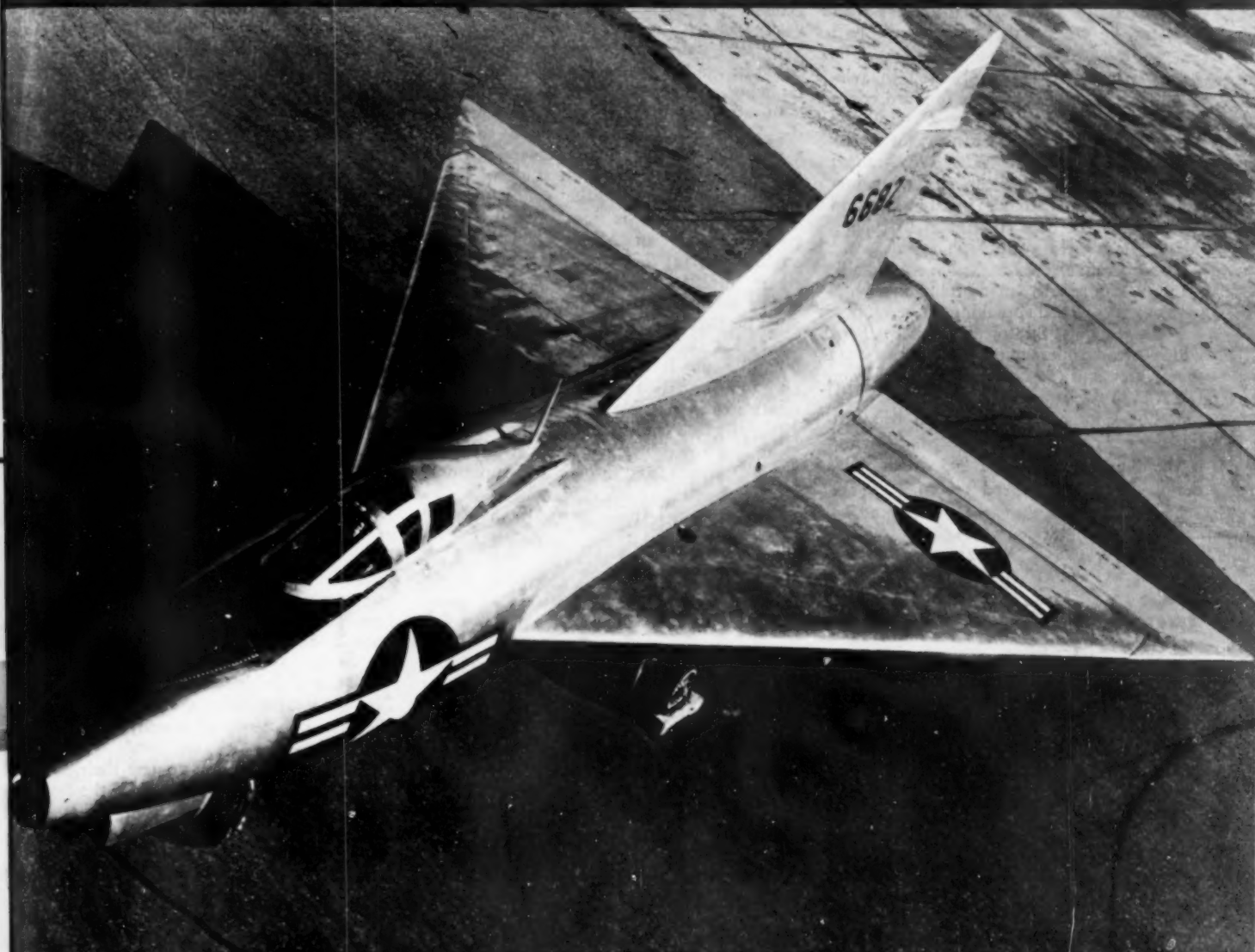
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March 5, 1949

TECHNOLOGY DEPARTMENT
SCIENCE NEWS LETTER

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MAR 6 1949

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Sweep-Back Plane

See Page 146

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AERONAUTICS

New Delta-Wing Plane

This is another experimental plane built to determine the value of the sweep-back wing designed for excessively high speeds.

See Front Cover

► THE new Delta-wing airplane, now under test at the U. S. Air Force base at Muroc, Calif., is another experimental craft to determine the real value of the so-called sweep-back wing which the National Advisory Committee for Aeronautics has been subjecting to wind-tunnel tests for the past few years.

As the term sweep-back is used in aviation it refers to wings whose forward edges extend backward at an angle with the body of the plane instead of at right angles as in conventional aircraft. Wind-tunnel tests indicate that the sweep-back wing presents less drag than the usual wing and is therefore perhaps desirable in planes designed for excessively high speeds.

This claim is already backed in two notable planes which recently made transcontinental passages in record breaking time. These are the Boeing Stratojet, U.S.A.F. B-47, which crossed the continent in less than four hours, and the Northrop Flying Wing, U.S.A.F. YB-49, which took a little over four hours for a transcontinental trip. Another speedy plane with sweep-back wings is the North American F-86, which holds the world's official speed record.

The new plane has a far different ap-

pearance from any of these, however, as shown on the cover of this week's SCIENCE NEWS LETTER. It resembles more the paper darts that schoolboys made and shot across the room to upset the quiet and peace of a study period. It might be said to resemble a giant bomb lying on and projecting forward from a giant equilateral triangular flat surface. In addition it has a vertical tailpiece projecting above the bomb just over the rear edge of the triangular wing surface to give stability in flight.

In addition to this radical appearance, the Delta wing has its forward edge at a sweep-back angle of 60 degrees. This is nearly twice the sweep-back angle of other planes now in use. Like other modern speedy planes, it is jet-propelled, being equipped with an Allison J-33 turbo-jet engine rated at 5,200 pounds thrust, with water injection.

The new Delta-wing plane, designed and built by Consolidated Vultee of San Diego, Calif., has been designated Model 7002 for identification. It is an experimental model, and no information has as yet been divulged relative to its possible speed or range. Tests already made indicate that this type of wing has low drag characteristics and satisfactory control in transonic and supersonic speed ranges.

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AERONAUTICS

Lamps for Landing System

► NEW sealed-beam lamps for use with the Civil Aeronautics Administration new slope-line approach light system for airports were revealed by General Electric. Rated at about 250 watts, approximately 600 of these lamps will be used at each installation.

The CAA slope-line approach lighting system has been adopted as standard by government authorities for installation at the commercial airports over which the Civil Aeronautics Administration has jurisdiction. This includes all the principal ports in the United States. An experimental installation at Indianapolis has demonstrated its efficiency. Eight or ten additional airports will be equipped with them in the near future, and others as soon as funds are available.

In the slope-line system, which provides a glide path as well as proper direction to the "touch" end of the runway, lighting units are placed at 100-foot intervals in "V" formation with the apex near the

landing strip. Each unit includes ten lamps, and it is in these that the new General Electric development will be used.

These units are at right angles to the approach path, and the long narrow boxes in which they are placed are at an angle of 45 degrees with the level earth and point inward on the approach path. When a pilot in the air is on the proper approach and glide path, the light units appear in two continuous lines, one on each side of the approach path. Otherwise, they appear as broken lines, somewhat like the teeth on a saw. (See SNL, Dec. 11, 1948).

In experimental work with this new approach lighting system, ordinary sealed-beam automobile headlights were used. They clearly indicated the advantages of the system over others but it was decided by CAA that lamps of greater candlepower were desirable. The new General Electric lamps, similar to the familiar automobile headlight, are of 250 watts, and have a beam spread of about 40 degrees horizon-

tally and eight degrees vertically. Like automobile headlights, they are of all-glass construction, and have the high efficiency characteristics of sealed-beam type of lamp.

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MEDICINE

Find Clue to Eye Disease In Premature Infants

► TOO MUCH vitamin and iron may be a possible explanation for the increase in recent years of a disease which strikes at the eyes of premature infants.

The disease is similar to congenital cataract but differs from it in that there are blood vessels in the membrane film located behind the crystalline lens of the eyes. The medical term for the blinding disease is retrolental fibroplasia.

Drs. V. Everett Kinsey and Leona Zacharias, of the departments of ophthalmology and obstetrics and the Howe Laboratory of Ophthalmology at Harvard Medical School, by the process of elimination, found that the disease was most prevalent in certain localities and that its increase in these places could be correlated with certain treatment given to the infant.

This treatment consists of giving premature infants multiple vitamin supplements mixed with water instead of oil, which seems to increase the absorption of vitamin A, and an increase in iron administration.

Although their findings seem to point to the treatment as contributing to the increase of the disease, they caution that it does so indirectly and not through a direct toxic effect.

Their survey covered the 10-year period, 1938 through 1947. Parents of infants born at the Boston Lying-in Hospital and the Providence Lying-in Hospital, where Drs. Kinsey and Zacharias are staff members, were contacted. Of the 372 babies weighing four pounds or less at birth who were born at the Boston hospital, 53 developed the disease.

In the Providence hospital there were 246 premature infants during the years 1941 through 1947, of which 16 developed the disease.

The scientists expect to test their theory in conjunction with the staffs of the Boston Lying-in Hospital and certain other hospitals, by omitting the iron and also the multiple vitamin preparation mixed with water in treatment of premature infants. Instead, the iron will be given when the infant is between two and three months of age and vitamin D will be substituted for the new vitamin treatment. In addition it is planned to supplement the diet with vitamin C daily. No vitamin A or vitamin B-complex will be given. The results will be published as soon as enough material exists for making a valid conclusion.

The investigators present their study in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Feb. 26).

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PHYSICS

New Way to Look at World

Two physicists propose a new approach in the most recent attempt to bring order and reason to physical theory. It is expressed in mathematical formulae.

► THE latest way of looking at the world is to apply different laws—or different sections of the same law—to the subatomic realms and the great, big universe.

The mathematicians and physicists who are puzzling out the meaning of cosmic-ray mesons and other mysterious particles within the atom are discussing the most recent attempt to bring order and reason to physical theory. This is a report in the British journal, *NATURE* (Feb. 5), by Dr. Max Born, leading German physicist in pre-Hitler days, now head of the department of mathematical physics at the University of Edinburgh, Scotland.

With a collaborator, Dr. H. S. Green, he has proposed a new approach to reconciling the relativity of Einstein and the quantum mechanics that is needed to explain the atom. Scientists have long striven for a mathematical unification for these two approaches, both successful in that they explain what happens in different spheres and predict what may be found experimentally.

The new Born-Green approach is still theory and it can only be expressed completely and accurately in mathematical formulae that constitute strange and impossible language to most of us.

But it boils down to this: The mathematics can be arranged so that the same

relationship can be used for both the subatomic and macroscopic worlds. In the case of the immense spaces of astronomy, the trick is to accent where things are and to almost wipe out the velocity effects because comparatively the momentum or speed of things is very slow. That gives something related to Einstein's special relativity. Then getting down inside the atom and its elementary particles—electron, proton, neutron and now several kinds of mesons or mesotrons—the velocities become all-important and swift, approaching that of light, the speediest possible 186,000 miles per second. Position becomes fuzzy and indeterminate, which does not concern us so much because the distances are so very small.

Dr. Born uses what are known as Lagrangian equations in his approach, and he also calls into play a general principle of reciprocity which he formulated some years ago. This states that the ultimate laws of physics should be symmetric in space-time and momentum energy. When Drs. Born and Green developed general field theories along such lines, they came up with computations of masses of particles that correspond roughly with some experimental results upon mesons, the particles most recently found in cosmic rays.

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MINERALOGY

New Manganese Deposits

► THERE is plenty of high-grade manganese for the American steel industry in newly discovered deposits near the mouth of the Amazon river in Brazil, reports Dr. Kenneth E. Caster of the University of Cincinnati.

They are much nearer to America than most other foreign manganese sources, and their development would free the United States of a need for the Soviet supply.

Dr. Caster is a geologist of the university's graduate school and has just returned from four years in South America where he was engaged in research under the auspices of the U. S. State Department and the Guggenheim Foundation.

Manganese is an essential metal in the manufacture of steel alloys and it plays an important part in other products. The United States has domestic deposits but the known reserves are far too small to meet the demands. Over 1,500,000 tons are imported normally each year. Russia is the

principal source of supply, with India, the Gold Coast of Africa, the Union of South Africa, Cuba, Chile and Brazil important. In prewar days Russia produced approximately one-half the manganese ore used in the world.

Brazil has a great deal of manganese, Dr. Caster states. Present mining is in two well-known areas, one in western Brazil near the Paraguay border, and one north of Rio de Janeiro. The deposits recently discovered are in the territory of Amapa between the Amazon and the Guianas, less than half as far from New York City as the other Brazilian deposits.

The Brazilian federal government a year ago authorized Brazilian companies to begin exploring these Amapa deposits. With its other deposits Brazil has much more manganese than needed to satisfy domestic needs. It is highly probable, Dr. Caster states, that these deposits may be of great and strategic importance to the U. S.

Metallurgical manganese ore produced in the United States during 1946 amounted to less than 135,000 tons, coming from seven states but the great bulk mined in Montana. Production in war years was considerably greater, reaching some 241,000 tons in 1944. This is a small amount when compared with the 1,749,000 tons of foreign manganese ore imported in 1946, a year in which imports exceeded normal.

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WILDLIFE-ENGINEERING

Life of Oyster in Shell Studied by New Device

► THE private life of an oyster or what goes on under the shell can now be studied by a new electronic device.

The instrument which permits study of the oyster without disturbing his normal shelled, and heretofore sheltered, life is called an ostreodynamometer. Movements of the oyster inside his shell are recorded on a paper as wiggly lines, which form an ostreodynograph. They look something like the records made of the earth's movements by a seismograph.

The ostreodynamometer was reported to the journal, *SCIENCE* (Feb. 11), by H. Malcolm Owen and Robert M. Ingle, Jr., of the Department of Wild Life and Fisheries in New Orleans and Charles R. Maduell, Jr., Delta Electronic Equipment Company.

They explain that the new apparatus permits scientists for the first time to study normal oyster life.

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DELVING INTO OYSTER'S LIFE
—This new electronic device, called an ostreodynamometer, permits the study of an oyster under its shell.

AERONAUTICS

Fog Dispersal System

► FOGS will hold no terror for incoming pilots to the Los Angeles Airport when the new thermal dispersal system being installed is completed. Burning diesel oil will provide the heat to "lift" the fogs to a high enough ceiling to permit clear visibility of the runways.

The first unit of the thermal dispersal system is already completed. Other units will follow rapidly. It is the first commercial installation of a system of this sort, although it has already been used in fields of the armed services. Familiarly, it is known as Fido, the name being British. Fido (fog intensive dispersal of) was developed and put into use in England during the war to permit the safe landing of war planes returning to British bases after missions over enemy country.

The system under installation in Los Angeles is an improved Fido. This one uses cheap oil for fuel, and the burners are controlled electrically by a single operator. Proper placement of the burners has been determined by study and experimentation. It was developed by the Todd Shipyards Corporation and its installation is sponsored by the U. S. Civil Aeronautics Administration and the Los Angeles Department of Airports.

The principle behind the operation of the thermal dispersal system is simple. By the application of heat, the saturation point of the atmosphere is raised to absorb water vapor over and in the immediate vicinity of the runway. Three high-pressure jet-atomizing nozzles are mounted in each of 392 burners erected about two feet above the ground. The oil is ignited by electricity, and electrical control regulates release of oil and thus the intensity of the flame.

The installation there is designed to give a 300- to 400-foot ceiling in the 2,000-foot approach zone, 250-foot ceiling in the 1,000-foot touchdown zone, and a ceiling of 200

feet in the remaining 3,000 feet of runway. The 392 burners, or "triads," parallel both sides of the main east-west runway and approach path for 6,000 feet.

Fido is only one of five navigation aides to be installed at the Los Angeles port to permit bad-weather landings. The others include high-intensity elevated runway lights, the new CAA "Slope-line Approach System," surveillance radar to locate all planes in the neighborhood and precision approach radar, a ground-controlled-approach (GCA) equipment.

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ENGINEERING

National Plumbing Code Sought by Committee

► A SINGLE national plumbing code is the objective of various organizations which will be represented in Washington early in March to perfect a code for voluntary adoption by state and local authorities, it was revealed.

Invitations to the meeting, which were extended jointly by the U. S. Department of Commerce and the Housing and Home Finance Agency, have been sent to six organizations. They are the American Standards Association, Building Officials Conference of America, Western Plumbing Officials Conference, American Society of Sanitary Engineers, Conference of State Sanitary Engineers and the Uniform Plumbing Code Committee.

When the Coordinating Committee is set up, it will become the standing committee on a national plumbing code. It will supplement the work already under way of the Uniform Plumbing Code Committee in hopes of an eventual agreement on a single national set of regulations. It will

assist municipalities on problems arising in the adoption or revision of codes.

Tests and other work necessary for revision and expansion of housing codes to an overall code have already been carried out by government departments. The setups for the tests are at the National Bureau of Standards. They include the complete equipment for the systems used in small houses and in two-story duplex dwellings. The arrangements provide the means of studying three major problems. These are self-siphonage of fixture traps, stack-vented and wet-vented installations.

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NUTRITION

What do birds derive from preening? p. 153.

CHEMISTRY

How Salt Substitute Kills

Rat experiments have shown that lithium chloride, used by some patients in place of salt, causes death by its inhibiting effect on the use of food by the body.

► THE WAY in which lithium chloride causes death has been discovered by Dr. John MacLeod, of the Cornell University Medical College in New York.

His experiments on rats show that lithium in low concentrations produces an inhibitory effect on the breakdown of glucose to lactic acid, one of the fundamental processes of the use of food in the body.

Deaths reported of patients with heart and kidney disease who used lithium chloride instead of ordinary sodium chloride salt in their diet are thus shown to have an experimental theoretical basis.

Dr. MacLeod's conclusions will appear in a paper ready for publication in the AMERICAN JOURNAL OF PHYSIOLOGY and were made available to Science Service on account of their relationship to the dangerous use of this chemical medically. The work was completed two years ago as a purely academic study and is only ready for publication now.

Dr. MacLeod found the inhibitory effect in human spermatozoa and he found that it destroyed the ability of these cells to move. When lithium chloride was injected under the skin of rats (dosage level of 120 milligrams per kilogram) it caused too much irritability in the rats, weakness of hind legs, and generalized tremors which appeared particularly when the rat was stimulated. In general such an acute dose of lithium chloride produces death in rats within 28 hours.

The chronic effects of injecting small doses of lithium chloride in rats daily over protracted periods, Dr. MacLeod found, is to produce such symptoms when an injection level of five milligrams daily and a total level of 150 milligrams is reached. This indicates that lithium is retained in the body, in part at least, possibly in the muscles.

Dr. MacLeod concludes that there is considerable resemblance in the effects in rats and the symptoms in human beings by analogous intakes of the salt. If the doses producing the effects in normal rats are extrapolated on a weight for weight basis to humans, an intake in the human of from 1.4 to 2.8 grams daily of the salt theoretically would produce symptoms in from two weeks to a month. (One gram is about a thirtieth of an ounce). Dr. MacLeod emphasized that this is theoretical and may have no relationship to the doses taken in the human toxicity cases recently reported.

Muscular weakness which is one of the characteristic symptoms in the rats and

humans is due, it is suggested, to interference with carbohydrate breakdown in the skeletal muscles, thus interfering with energy breakdown in the muscle. Lithium chloride might impose an extra strain on an already deficient heart, in cases of cardiac deficiency on a salt-free or salt-substitute diet.

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PHYSICS

Cornell Founder's Tunnel Site of Cosmic Ray Studies

► A WATER tunnel blasted through 193 feet of solid rock more than a century ago by a young engineer is now being used for modern cosmic ray studies by scientists from the University which the engineer later founded.

Ezra Cornell, 24, drilled the tunnel while he was superintendent of Beebe's mill in Ithaca, N. Y., in 1831. More than three decades later, in 1865, he founded Cornell University.

Dr. Kenneth I. Greisen, director of cosmic ray research in the University's

Floyd Newman Laboratory of Nuclear Studies, announced that Cornell scientists are going to use the tunnel for studies in one of the most advanced fields of modern physics, cosmic ray research. The scientists will measure the intensity of the cosmic ray bombardment as it is filtered by the 25 feet of limestone above the tunnel.

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ASTRONOMY

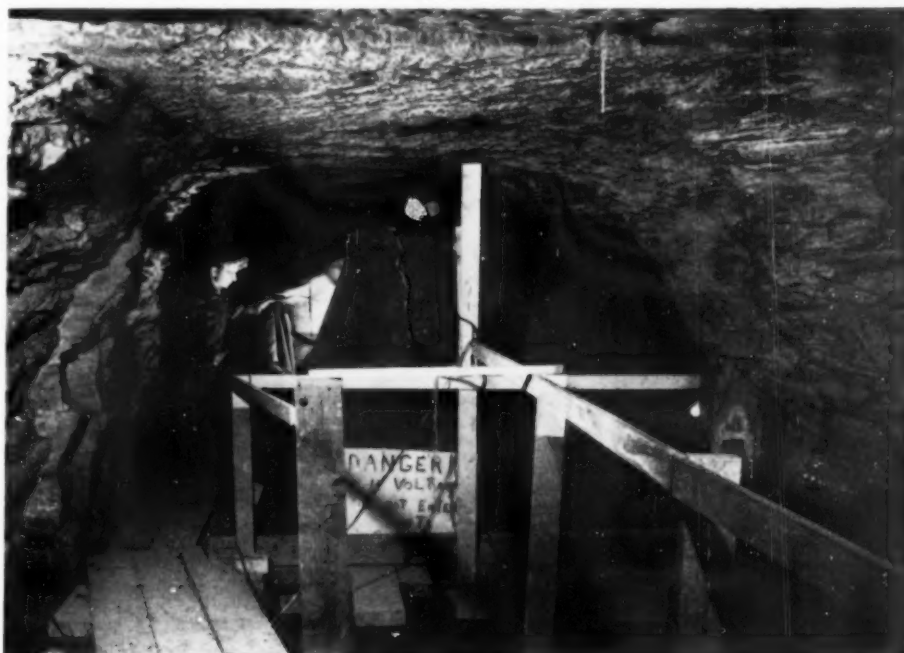
Faint Object Spotted In Constellation of Leo

► A FAINT object has been spotted moving across the constellation of Leo, the lion, visible these winter evenings high in the southeast. It lacks an identifying tail and astronomers are not yet certain whether it is a comet or a minor planet.

Of the sixteenth magnitude and thus far too faint to be seen with any but the best telescopes, this celestial traveler was discovered Feb. 19 by Dr. Frank K. Edmondson of the Goethe Link Observatory of the University of Indiana, Bloomington, Ind.

The object is moving northwest, according to word just received at Harvard College Observatory, astronomical clearing house for the western hemisphere. When discovered on Feb. 19, the object's right ascension was nine hours, 46.6 minutes, its declination plus 11 degrees, 48 minutes. Its daily motion in right ascension is minus one minute, five seconds; in declination plus eight minutes.

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STUDY MESON BEHAVIOR—This tent, pitched on a platform over six feet of water, shelters recording equipment in a water tunnel where the behavior of cosmic ray particles are being studied.

GENERAL SCIENCE

Peaceful Atomic Control

► THE United Nations which has not been able to reach any agreement on international atomic energy controls might turn to the peaceful, non-military side of the problem. This proposal was made by the Federation of American Scientists in Washington.

The Federation, through its chairman, Dr. Arthur Roberts of the State University of Iowa physics department, suggested the peaceful approach to atomic control in a letter to Trygve Lie, UN secretary general.

Job urged for the UN is supervising distribution of the non-dangerous radioactive varieties, or isotopes, of chemical elements, an important but bombless by-product of atomic energy piles.

An appeal was also made for more detailed consideration of the majority plan for international control of atomic energy which the U.S.S.R. has balked at.

A four-point program was proposed by the Federation for UNAEC discussions to develop details of the international control plan. The four points:

1. Financial, administrative and other details of the operation of the proposed international control authority.
2. Quotas to be allotted each country of such atomic facilities as nuclear reactors, a matter which the Soviets have indicated they are willing to discuss.
3. Development of a system of stages leading from the present situation of domestic atomic energy programs to international controls without special advantages to any nation.
4. Sanctions to be used by the proposed international atomic authority for dealing with violations of its rules.

The Federation statement just issued by Dr. Roberts, said that the organization welcomed the reopening of discussions in the UNAEC. It urged the UN commission to give consideration to the suggestion of Soviet Delegate Vishinsky that destruction of existing atomic weapons might be carried on simultaneously with the setting up of international controls. The suggestion came last fall in the General Assembly after the Soviets had previously insisted that weapons should be destroyed first.

Dr. Roberts emphasized that the Federation proposals stressed details of the majority plan, because each nation is now working out its own domestic program. These systems can be developed in ways which will fit in with future international controls only if more complete proposals are made, he argued.

The statement said that international control of atomic energy must be considered both as a single problem and as a part of the overall problem of international security.

As research materials for scientists, isotopes promise important advances in medicine, agriculture and industry, as well as in basic scientific research.

The United States is now world's leading producer and exporter of these important research tools. But isotopes are scheduled to become a big, competitive international trade commodity, Dr. Roberts explained.

Three other nations now already make radioactive isotopes in atomic piles and three more, probably four, have scheduled early construction of atomic piles which will produce these isotopes. Canada, Great Britain and France are already making isotopes in chain-reacting piles. Sweden, Norway and India have scheduled construction of piles.

The U.S.S.R. is probably at work on such an atomic energy development, Dr. Roberts said.

International trade in these peaceful atomic products, he emphasized, would create problems which do not depend on

international control of atomic energy. Some of these problems are licensing, health protection, standards of measurement, distribution procedures, nomenclature and prices of the isotopes.

Greatest scientific progress from use of the isotopes would be made by UN supervision, the Federation chairman argued, because researchers in small as well as large countries would get the peaceful atomic products they needed for their work.

Supplies of radioactive isotopes will be unlimited and even the smallest laboratories can use them, the letter declared. A UN agency could serve as a clearing house for research information and serve to stimulate world scientific progress, it was contended.

Successful operation of the UN in the field of non-military atomic energy, might help encourage solutions of some of the problems which have brought the UN's Atomic Energy Commission to a deadlock, Dr. Roberts said.

"There is very little that can be lost by initiating such a program and much to be gained," the appeal to the UN Secretary General concluded.

The proposal made in the letter was made previously by the Federation in a report last year.

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PUBLIC HEALTH

Fighting Air Pollution

► "If people won't fight air pollution to save lives, maybe they will to save stockings." This was the reaction of one chemist to the Case of the Running Nylons, reported from Jacksonville, Fla.

Sulfur compounds clinging to particles in the air are the best bet for "who done it" in the case of the nylons. But scientists point out that lives as well as stockings can be saved by cleaning up the air over American cities. A more tragic case of air pollution was the loss of 20 lives in Donora, Pa., last fall from a death-dealing smog. Scientists are still studying the air over Donora to get full facts on the chemistry of the disaster there.

More facts are known about the nylons, because that same thing has happened elsewhere. When it struck Washington in 1940, scientists at the National Bureau of Standards solved the case. Sulfur dioxide on particles in the air from chimneys in a small area were forming sulfuric acid. The particles were found on the running hosiery—both nylons and silk. The acid weakened a thread, causing a run—or in some cases many threads on the same stocking.

The nylon or silk does not vanish into thin air or form a gas which makes them disappear. They simply get runs.

Sulfur compounds in the air are an old enemy of clothes. Several years ago in New England, all types of cotton goods, but particularly men's shirts, were found

to be breaking up under certain apparently normal conditions. Investigation revealed that sulfuric acid was being formed from sulfur on particles in the air.

Scientific tests indicate that the runs will strike old or new stockings of either nylon or silk. The sheerest hose pulled tightly over the leg will, of course, be most likely to have the threads wear through.

But the best way to prevent run epidemics is simply to keep the air clean. In addition to saving stockings, it can save health and lives.

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Calabar beans, from which a drug is obtained, grow wild in Liberia; natives gather the beans from the inland bushes on which they grow and carry them in headloads to the coast for shipment to Europe.

Montana is said to have the widest range of temperatures of any state in the union; highs of 110 degrees Fahrenheit have been recorded, also lows of 50 degrees below zero.

Twelve dams on the Connecticut river are proposed to control flood water; a pact for the purpose has been signed by Vermont, New Hampshire, Massachusetts and Connecticut, and is now ready for Federal action.

AERONAUTICS

New Explorer To Replace Photographic Airplane

➤ A NEW "Explorer" to replace the notable photographic airplane of a decade ago is promised for the future. The original Explorer is to take a place in the Smithsonian Institution in Washington beside the Wright Brothers' Kittyhawk and Lindbergh's Spirit of St. Louis.

The plane to join the government group as important in aviation progress was constructed in the middle thirties because there was no plane at that time that met the exacting requirements imposed by the rapidly developing aerial survey industry. Its principal years of activity extended from 1938 through 1942. It is a product of Talbert Abrams and the Abrams Aerial Survey Corporation, Lansing, Mich.

Unobstructed visibility, high rate of climb, speed and stability are requirements in an aerial survey plane. The Explorer possessed these to a marked degree. Its glassed-in nose gave clear vision in all directions. It climbed at 1,500 feet a minute and had a speed of about 200 miles an hour.

This plane, with its pusher propellers and twin-boom tail, is powered by a 450-horsepower Wright Whirlwind engine and has a wing-span of 36 feet. Its place in the historical museum is due to its being the forerunner of a type of plane specifically designed for aerial mapping and survey work.

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ENGINEERING

Wall Blanket of Hot Air Features New Home Heating

➤ A BLANKET of warm air from the furnace spread over the walls of a room is the feature of a new home-heating system demonstrated at the exposition of the National Association of Home Builders in Chicago. It is a General Electric development, and said to be efficient and economical.

Special registers and grilles are used in this so-called Air-Wall system that direct the forced warm air upward in a fan-like pattern in front of the wall. A hidden feature is use of standard four-inch stove pipe, instead of the more expensive rectangular ducts usually installed to bring the hot air to the registers. This lessens the cost of ducts and installation as much as 50%, it is claimed.

Approximately 30% less air is circulated in the new system as compared with customary warm air systems. The air is supplied at somewhat higher temperatures for mixing with room air as it leaves the registers. Good circulation of air within the room is provided, and there is less tendency for the warm air to cling to the ceiling.

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PHOTOGRAPHIC SHIP—Beside the "Explorer" is shown its builder, Talbert Abrams, who examines a model of a proposed new "Explorer II". Shown also are various aerial cameras used aboard the photographic plane.

MEDICINE

Check Cancer by "Balance"

This new anti-cancer idea is that the development, prevention and cure of the disease depends on the balance or lack of it between various body chemicals.

➤ FIGHTING cancer through "balance" is the new idea discussed by experts gathered at Memphis, Tenn., for a national cancer conference sponsored jointly by the American Cancer Society and the National Cancer Institute.

The idea is that the development of cancer, its prevention and its cure all depend on the balance or lack of it between various chemical and other influences in the body. If these influences get out of balance, the body would be in a condition favorable to the development of cancer. If doctors can restore the balance, the cancer will be cured, or, as doctors prefer to put it, controlled.

The patient with a controlled cancer survives. How long he goes on surviving the cancer depends on how good the control is.

These new ideas were outlined in a report by Dr. J. Samuel Binkley, attending surgeon at the Los Angeles, Calif., Tumor Institute.

Vitamins, hormones, enzymes and other complex chemicals all play a part in tipping the scales for or against cancer, according to his theory on balance and

cancer control. Surgery or X-ray and radium treatment, he suggested, probably start a process toward restoring the balance for health and against the cancer. This would explain why some patients with early curable cancer fail to survive five years after adequate treatment and why others with a borderline or clinically hopeless stage of cancer do sometimes survive after treatment. The treatment helps but does not by itself bring the cancer under control. It starts the process which the patient's body is then able to carry on.

It is possible, Dr. Binkley stated, that cancer cells may circulate in lymph vessels, linger in lymph nodes and propagate their kind for months and even years in a state of "balance," some cancer cells being destroyed as fast as new ones are formed.

If scientists will analyze five-year-survivals with a view to the "inherent aids other than surgery or radiation" they may, Dr. Binkley believes, "open the door to a method of preparing the body physiology or altering existing conditions of the patient toward a more favorable setting for a cure."

Science News Letter, March 5, 1949

GEOLOGY

Young Scientist Repeats Evolutionary Step in Lab

► AN important step in evolution, that may have taken place spontaneously many millions of years ago, was repeated under laboratory conditions in experiments carried out in Galveston, Texas, by 16-year-old Robert Anigstein, a senior at Ball High School. He induced a one-celled animal species that normally lives in sea water to acclimate itself to life in water with considerably lower salt content.

Mr. Anigstein isolated one species of single-celled animals (technically, ciliate protozoans) from the saline water of Galveston Bay, and kept cultures of it going in laboratory dishes full of sea water, observing its normal rate of reproduction under these conditions. Then he diluted the sea water to various lower salt contents, from 80% down to 10%, maintaining one set of cultures at full 100% sea-water concentration, as controls.

"With the exception of one culture," he reports, "ciliates in concentrations above 50% multiply at much the same rate as the ones in the accompanying control cultures. The ciliates transferred to 50% sea water reproduce very rapidly for the first one or two days after transfer; then the rate drops. At 30%, the rate was high the first two days, after which reproduction temporarily ceased. The ciliates surviving the transfer to the 40% sea water began to multiply at nearly the rate of the controls after the third day."

In dilutions of less than 20% sea water the animals slowly sickened and died. The experiments therefore proved ability on the part of this primitive animal species to adapt itself to brackish water, but not to a close approach to fully fresh-water conditions.

Mr. Anigstein is one of 40 winners in the nation-wide Eighth Annual Science Talent Search. He will be in Washington, D. C., for the Science Talent Institute, held March 3 through 7, at which time \$11,000 in Westinghouse Science Scholarships will be awarded.

Science News Letter, March 5, 1949

BACTERIOLOGY

Test for Disinfectants Devised by Student

► A NEW test for germ-killing chemicals, in which volunteer human guinea-pigs can be used without harm or danger to themselves, has been devised by John W. Kimball, 18, a senior at Phillips Academy in Andover, Mass. In his experiments he had the help of his classmates, who loaned him the use of the skin on their forearms in the interests of research.

Present testing methods, Mr. Kimball points out, are based either on the use of

the chemicals against bacterial cultures in test tubes or on the injection of the germs into the bodies of mice or other live animals. The first method, he feels, is unrealistic, while the second is often difficult and slow, and may be costly besides. It does, however, measure the effectiveness of the compounds when used against bacteria actually in contact with living tissue, which is lacking in the test-tube method.

Mr. Kimball's new method consists in swabbing a sample of the solution to be tested on a patch of relatively hair-free skin in the presence of bacteria. After a measured time interval, to give the compound a chance to act, the same area is mopped up with a moistened sterile cotton swab. The swab, with the germs it has picked up, is then thoroughly shaken out in a sterile salt solution, from which a measured sample is extracted for culturing in an incubator by standard bacteriological methods. The number of germ colonies resulting is an inverse measure of the effectiveness of the compound under test.

In one of the test series, the relatively new disinfectant, merthiolate, was found more effective against bacteria on human skin than the old stand-by, tincture of iodine. This is the reverse of results obtained by the U. S. Food and Drug Administration test-tube method. Mr. Kimball believes the discrepancy is due to the fact that iodine combines with the albumin of the skin, thereby losing effectiveness against the bacteria, whereas the merthiolate is not affected by the presence of the skin and is thus free to do the work for which it is intended.

Mr. Kimball is one of the 40 winners of the Eighth Annual Science Talent Search.

Science News Letter, March 5, 1949

BACTERIOLOGY

Disease-Bearing Villians Make Debut in New Movie

► A NEW movie with the worst villians in screen history has had its premiere in Baltimore.

Living cancerous tissue in a mouse and *Endamoeba histolytica*, a one-celled organism that causes amebic dysentery, are the villians of one of the first motion pictures of living cells ever produced.

The new film, shown at a meeting of the Society of American Bacteriologists at the Johns Hopkins University, uses magnifications of up to 1,000-power through a Bausch and Lomb phase contrast microscope.

Not all the stars of the movie are villians. If the disease-bearers are the villians, then the hero is probably a human sperm.

C. G. Grand of New York University directed the scientific motion picture which was photographed by Jack Godrich of Memorial Hospital, New York.

Science News Letter, March 5, 1949

IN SCIENCE

GENERAL SCIENCE

Highest Laboratory Is Subject of Controversy

► SCIENTISTS have a new not-very-scientific controversy going. It's over world's highest laboratory.

The journal, *SCIENCE*, started it last fall when it referred to a laboratory on the summit of Mt. Evans, Colo., as the "highest laboratory in the world."

This statement was disputed by Dr. Alberto Hurtado of Lima, Peru. Dr. Hurtado, now visiting medical centers in this country, explains that the Institute of Andean Biology at Morococha, Peru, is the highest. Altitude of Peruvian laboratory is 14,900 feet, compared with a mere 14,156 feet for Mt. Evans.

But there is evidence that neither one of these is the literal top of scientific pursuit on the earth's surface. Two University of Chicago physicists, Albert B. Weaver and Marcel Schein, recently described how they dropped laboratory equipment near the top of Mt. McKinley in Alaska and then climbed up the mountain to use it.

Mt. McKinley is North America's highest peak, and the laboratory was at an altitude of some 18,000 feet. The Chicago scientists made cosmic ray observations at the laboratory which was higher than, though not so permanent as, the high-altitude scientific centers in Peru and Colorado.

These laboratories, of course, are just the earth-bound ones. Flying laboratories, made from B-29 bombers, have carried cosmic ray scientists and their instruments up to altitudes of 40,000 feet. And unmanned "laboratories," carrying scientific apparatus, have reached altitudes greater than 100,000 feet with balloons and higher than 250 miles with rockets.

Science News Letter, March 5, 1949

GENERAL SCIENCE

Scientists, Too, Object To Those Big \$10 Words

► EVEN scientists sometimes get fed up with the \$10 words in their vocabularies. Latest sign of this is the suggestion from Ruth S. Bittner of the Medical College of Virginia's department of bacteriology. In the journal, *SCIENCE* (Feb. 18), she says:

"I have listened to numerous lectures in which the speaker mouthed the 10-syllabled word desoxyribonucleic acid from five to 25 times."

She wants it shortened to "dorna."

The acid is an important chemical constituent of the nuclei of cells.

Science News Letter, March 5, 1949

NEW FIELDS

CHEMISTRY

Nazi Poison Gas Checked By American Gas Masks

► THE Soviets, as well as the Army's Chemical Corps, have the Nazi's famed poison gas, tabun, but this fact isn't greatly disturbing officials of the National Military Establishment.

Gas masks issued during World War II, as well as today's models, are adequate protection against tabun, contrary to some reports. And the chemistry of the gas, although a military secret, is thoroughly understood, Chemical Corps spokesmen emphasize.

Tabun is a potent war gas. It is difficult to detect as it is practically tasteless and odorless, particularly in contrast to some types of war chemicals. It will not, however, penetrate clothing or gas masks.

Nazi plants for producing the gas were located in areas now in the Soviet Zone in Germany.

Best bet why the Chemical Corps has let out the secret of the Nazi's tabun: we have something more deadly.

Science News Letter, March 5, 1949

METEOROLOGY

New Instrument Measures Temperature of Rainfall

► HOW cold is a cold rain?

You can't get the answer to that one by reading a thermometer outdoors, or even by calling up the Weather Bureau. For such thermometer readings give you the temperature of the air between the raindrops, not the temperature of the rain itself.

To arrive at a correct answer, three meteorologists working on the U. S. Weather Bureau Thunderstorm Project have built a special instrument that collects samples of the falling rain as rapidly as possible, and automatically measures their temperature with a carefully insulated electric thermometer.

In one type of rainstorm, they found, the first-falling drops are likely to be somewhat cooler than the air near ground level. This is due at least partly to the fact that the drops have been losing water by evaporation during their fall; as is well known, evaporation produces chilling. So the farther the drops have fallen, the colder they are.

In a second type, the raindrops are much colder than the surrounding air. These seem to be drops that began their fall as hail but have thawed as they came near the ground.

Freshly melted ice can be expected to be cold.

The third principal type of rain comes when the storm is growing older, and the air near the ground has already become well chilled and saturated with water vapor. Here there is little difference between the air temperature and that of the falling water.

Participants in this research program were Horace R. Byers, Harry Moses and Patrick J. Harney. Details of the work, together with diagrams of their instrument, were presented in the JOURNAL OF METEOROLOGY (Feb.).

Science News Letter, March 5, 1949

HOME ECONOMICS

Girls Should Be Taught Facts of Housing

► GIRLS in home economics classes should be taught the facts of housing so that fewer of them will be disappointed in planning their "dream houses," a home management teacher has advised.

If girls are taught to select food and clothing, why not teach them house selection? asks Grace B. Gerard of Columbia University.

She said that girls should be taught that home ownership is not always possible.

The "dream house" plans may lead only to disappointment and frustration, cautions Miss Gerard in the JOURNAL OF HOME ECONOMICS (Feb.).

Among other subjects for a course in housing, she proposes that home economics students study financing, prefabricated houses, and new materials and construction methods.

"We can have better housing in America, if home economists will face facts," declares Miss Gerard.

Science News Letter, March 5, 1949

ENGINEERING

Rubber Insulators Replace Glass on Telegraph Poles

► FUN for boys in throwing rocks to break the familiar glass insulators on telegraph poles is on its way out. Unbreakable rubber insulators are to replace the breakable glass, Western Union engineers have revealed. They have already been installed for field testing.

The new rubber insulators are inexpensive, much smaller and weigh only one-tenth as much as the glass ones. H. H. Wheeler and W. F. Markley, of Western Union, told the American Institute of Electrical Engineers in New York. Many tests had to be made to find a rubber hard enough for use, but soft enough not to break. The small black rubber insulator developed lets drops of water roll off rather than spread out and cause leakage of electric current.

Science News Letter, March 5, 1949

NUTRITION

Birds' Preening Gives Them Their Vitamins

► PREENING, on the part of birds, is more than a beautifying gesture. It is a health measure through which birds get their anti-rickets vitamin D. Cats and other animals that lick their furry coats painstakingly are also probably giving themselves doses of vitamin D. Dr. G. H. Bourne of London Hospital Medical College points out in the scientific journal, *Nature* (Feb. 12).

A Chinese scientist, Dr. H. C. Hou, found by feeding experiments, Dr. Bourne recalls, that the skin and feathers of fowls exposed to the sun had anti-rickets effect, but if the birds' preen glands were removed and vitamin D excluded from their diet they developed rickets.

The birds apparently get their vitamin D from swallowing irradiated preen-gland oil in the course of preening. Furry animals get their vitamin from the oil they lick off their hair, it appears from other experiments of Dr. Hou's.

Science News Letter, March 5, 1949

PSYCHIATRY

Scientists Are Skeptical On Drugging of Mindszenty

► THE IDEA that Cardinal Mindszenty was drugged or electroshocked into his confession to charges against him by the Communist government of Hungary persists although medical scientists are for the most part highly skeptical.

Electroshock treatments, given to mentally sick people, cause a temporary loss of memory. But one psychiatrist questioned does not think the treatment would cause anyone to negate anything he had said in the past.

As to drugs, this psychiatrist said he does not know of any which would produce the effect of making a man negate or recant his previous statements. Other forms of mental torture which are not chemical could produce this effect.

A combination of scopolamine, the twilight sleep drug once popular for relieving childbirth pain, and morphine would make a person forget things or produce pleasurable dreams.

Actedron, known in this country as benzedrine, has been used for its apparently stimulating effects. Under the name of "pep pills," students took it to stay awake while cramming for examinations.

Crazy ideas, hearing voices and acute pain and other symptoms suggesting appendicitis are among symptoms of benzedrine poisoning that have been seen in persons who took benzedrine to get a "lift." Chronic benzedrine addicts showed aggressive and rebellious behavior, poor judgment, lack of self-control and loss of sleep, appetite and weight.

Science News Letter, March 5, 1949

OCEANOGRAPHY

Solving Mysteries of the Sea

Discovery of giant mountains and canyons and different types of sea animals, some never before seen, is the reward of scientists dragging the ocean for its secrets.

By MARTHA G. MORROW

► DAVY JONES is beginning to tell some of his secrets. For instance, scientists recently have learned that:

The Gulf Stream, considerably narrower and swifter than previously supposed, meanders like a great river.

Soft, unconsolidated sediment, 3,000 feet thick in places, has been found to overlie the solid floor of the ocean in some regions.

Giant undersea waves, up to 650 feet high, exist in the ocean but move slower than surface waves.

Surface waves can travel so fast they sometimes outrun the wind that is pushing them along.

And here are deep-sea long shots that may some day pay off:

Discovery of new oil fields through knowledge of the process by which petroleum is formed.

Long-range weather forecasting for coastal regions through studies of ocean currents.

Physicists, biologists, geologists and chemists making the ocean their specialty must be a particularly hardy sort. They spend many months at sea; their laboratory is a tossing, pitching vessel. Then follow years of tedious research, during which the data and samples gathered at sea are examined and analyzed.

Find Uncharted Mountain

The auxiliary ketch *Atlantis* is the pride of the privately-endowed Woods Hole Oceanographic Institution at Woods Hole, Mass. Recently a hitherto uncharted mountain rising 6,000 feet above the ocean floor east of Bermuda was discovered by scientists sailing the *Atlantis* in this ship, one of a fleet of eight boats belonging to the institution.

The chief floating laboratory of the Scripps Institution of Oceanography of the University of California at La Jolla, Calif., is the *E. W. Scripps*, formerly a movie star's luxury yacht. Three additional vessels are being equipped to supplement this craft; two are ex-Navy vessels, one a former fishing boat.

Cruising the Pacific Ocean, the *E. W. Scripps* has been instrumental in exploring deeply-submerged mountain peaks and ocean-covered canyons with sheer rock walls a mile or so high. One of these, off Monterey, Calif., is larger than the Grand Canyon.

As man cannot lower himself to the depths these ocean experts wish to explore, a number of ingenious devices have been constructed for sampling the ocean.

One of the newest instruments as well as the most intricate records simultaneously the temperature and degree of saltiness of sea water, and the depth at which the instrument is operating. Connected to a recorder in the ship, it makes possible rapid determination of those variables vital to establishing surface and sub-surface ocean currents. The device cannot, however, be lowered more than several hundred feet.

Samples of sea water, to be analyzed for iron, oxygen, salinity and alkalinity, are collected in Nansen bottles. In operation a half-dozen or so of these metal tubes, with both ends open, are hooked to a wire at pre-determined intervals.

Recording Water Temperature

When the bottles have reached the desired depth in the ocean and sufficient time has been allowed for their accompanying thermometers to record the water temperature, a small weight is sent sliding down the wire. This "messenger" starts a chain reaction which closes and inverts each bottle and breaks the mercury thread in such a way that the temperature of the water at various depths can be read later.

Another way to obtain water temperature is to lower a bathythermograph or diving thermometer. This is used while the vessel is proceeding at normal speed. It records the temperature of the water against depth on a smoked glass slide, easily read.

Life in the sea is collected in silken nets, of cloth similar to that used for sifting flour. Some of the tow nets can be opened and closed at a given depth to keep the microscopic plant and animal life found there from being mixed with that living at another depth.

So many different types of animals exist in the sea that a net, dipped deep in the ocean, frequently yields a species never before seen. Marine scientists keep prying into the private life of all kinds of sea life, from bacteria to whales.

The bottom of the ocean is explored in a number of ways. Solid samples of sediment, for instance, are grabbed by an "orangepeel" dredge. Lowered with its jaws open, when it reaches the bottom this instrument automatically closes.

Cores are punched from the ocean bottom in much the same way than an apple is cored. Allowed to fall free as it nears the bottom, the coring tube is driven into the sediment by ballast, weighing up to 1,000 pounds.

One instrument stamps out short cores three feet long, another brings up sections up to 15 feet in length. The thin cross-

section of sediment it brings up enables us to trace a million or so years into the history of the ocean, and of the world. From the remains of microscopic animals once living in the ocean, scientists can tell at what period the water was shallow, at what time deep; when warm and when cold.

Long cores of sediment up to 72 feet were obtained recently by a Swedish expedition on the research vessel *Albatross*. This instrument utilizes the high water pressure at great depths to force the sediment upward into the tube, while the tube in turn is pressed into the sediment by a heavy weight. Recently, cores up to 37 feet long have been secured by American oceanographers.

The gloomy appearance of the ocean and some of the sea animals that live three and a half miles down have been snapped by an underwater camera. The camera consists essentially of a fairly cheap instrument in a pressure-proofed housing, a trigger mechanism and a flashlight. When the trigger, hung below the camera, touches bottom, a flash bulb goes off. Sea spiders, brittle stars, sponges or whatever else may be present are photographed in their native habitat. The vertical cliff walls of the submarine canyons have also been snapped.



EXPLORING THE OCEAN FLOOR—By exploding a small bomb astern the *Atlantis*, ship of the Woods Hole Oceanographic Institution, and timing the returning echoes, the thickness of the sedimentary carpet on the ocean floor can be determined.



LIFE UNDER THE SEA—Rockfish, gorgonians and sea-cucumber are shown in this underwater photograph by Frank Haymaker taken at a depth of 110 feet.

More accurate charting of the location and velocity of ocean currents far out of sight of land has been made possible chiefly through the use of war-born Loran. This radio-navigation aid is particularly good in giving an accurate picture of a vessel's changes in position as she drifts or sails along. By tacking in and out of the edge of a current, an oceanographic vessel can determine the course of a current.

A trick used by oil geologists on land has been adapted to the sea. The thickness of the sedimentary carpet underneath the ocean can be determined by exploding a small bomb astern the ship. The first weak echo of the explosion is returned by the top of the sediment, the second strong one comes from the firmer rockbed beneath. Since sound is assumed to travel through the sediment 4,500 feet a second, the thickness of the sediment can be estimated by recording the time interval between the two echoes.

Bottom Surprisingly Rough

The bottom of the ocean is surprisingly rough, with many flat-topped sea mountains rising steeply from the surrounding muddy plains. In fact the plains are proving to be rather rare. In some places the sedimentary deposits are thousands of feet deep, in others the bedrock is practically nude. Findings such as these pose many questions to oceanographers.

Since oceans cover some 71% of the earth's surface, knowledge of their actions is important in peace as well as in war. The Oceanographic Division of the Hydrographic Office, Department of the Navy, has been set up as a clearing house for

such material. On Naval expeditions planned for other studies, the office sees that someone with a knowledge of oceanography goes along. If something new is reported about the ocean, those who may best use the data are notified.

Step by step men are being trained to explore various phases of the ocean. Advanced courses in oceanography are given at Scripps Institution of Oceanography of the University of California, Yale University's Bingham Oceanographic Laboratories, the University of Washington at its Oceanographic Laboratories and New York University. Numerous scientists come each summer to the Woods Hole Oceanographic Institution for specific research.

Problems on underwater acoustics are studied at the U. S. Naval Electronics Laboratory at San Diego, the U. S. Navy Underwater Sound Laboratory at New London and the Naval Research Laboratory at Washington, D. C. The U. S. Fish and Wildlife Service specializes in biology of the sea.

Gradually the shape and character of the ocean bottom, and the action of the waters within the seas, are being revealed. Some day we may know much more about the history and origin of the earth because of studies of that larger portion of the earth hidden beneath the waves.

Science News Letter, March 5, 1949

Vermiculite, a mineral that expands greatly and permanently by heat treatment, is widely used in making light-weight concrete; it is found in several places in America, but the principal supply comes from Montana.

INVENTION

Foul Ball Indicator Will Mechanize Close Decisions

► BASE hit or foul ball? In a few weeks now, fans will be advising umpires to go and have their eyes examined, after calling a close one just inside or just outside the foul line.

To take this wrangle-causing uncertainty out of baseball a Washington inventor, Allen K. Nelson, has devised what he calls a foul-ball indicator. It consists of a post, to be set at the far end of the outfield on the foul line, with a pair of cross-arms from which a series of free-swinging rods are suspended. Half the rods are thus in "fair" territory, the other half in "foul".

Electrical connections from the rods are so arranged that if a batted ball hits one of the rods on the "fair" side it will cause a green lamp to light up, while if the impact is against a rod on the "foul" side a red stop-signal will be flashed to the batter—and he'll have to wait for a better one to take a bite out of.

U. S. patent 2,461,836 has just been granted on this invention.

Science News Letter, March 5, 1949

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ENGINEERING

Underground Coal Fires

► AN IMPORTANT step in coal conservation, and in the protection of health and property, is now underway by the U. S. Bureau of Mines in extinguishing underground fires in coal seams. The new work is made possible by an appropriation of \$250,000 by the last Congress.

There are some 50 such fires in coal beds in seven states that have been investigated by the Bureau in the past six months, James Boyd, director of the government agency, has revealed. Some of them have burned uncontrolled for years, he stated. An underground or outcrop coal-mine fire will be likely to burn as long as there is combustible material to consume and a supply of oxygen to keep the fire alive.

These fires, originating usually through carelessness, present a serious threat to buildings, surface property, and the life and health of persons near the affected area. Most of the outcrop fires are believed to have started from burning rubbish, forest fires, or workmen, hunters or others building fires near the outcrop of the coal bed. Fires in abandoned mines have often started in debris left in the mine. They travel from the abandoned mine to other locations.

Work in extinguishing underground fires has already been started in two locations, one in Pennsylvania anthracite area, the other in western Colorado, near the Bureau's plant at Rifle for recovering fuel oils from oil shale. If not checked, this burning will destroy over 1,500,000 tons of bituminous coal adjacent to a mine now abandoned because of this fire.

The job of extinguishing an underground

coal fire is not easy, and it costs a lot of money. The process usually consists of stripping along the outcrop of the coal beds that have been partly mined and abandoned, back-filling with an incombustible material, excavations, drillings, flushing, flooding the region, and in many cases the relocation of buildings that interfere with fire-control operations.

Fire control in an active mine is the job of the operator. In unopened mines and abandoned mines, it is usually too big and expensive an undertaking for the owner. The Bureau's work will be confined largely to the abandoned mines, particularly where the fire is a hazard to the neighborhood, and from which additional coal may some day be wanted even if mining costs will be much higher than was required to remove the more desirable seams.

Science News Letter, March 5, 1949

BIOCHEMISTRY

Anti-Clot Drug's Effect Tested by Student Winner

► THE experiments were a complete success, yet the rabbit came out of them alive and healthy. So everybody was satisfied—including the rabbit.

The experiments in question were on the effects of the spoiled sweet clover drug, dicoumarol, on the clotting time of blood, in living animals. The experimenter was petite brunette Helen Claire Oels, 17, senior at Little Flower Catholic High School for Girls in Philadelphia. The research job she had laid out for herself seemed away over her head, to an older scientist on the sidelines; but she showed that she was perfectly able to carry it through.

Dicoumarol's principal effect is greatly to diminish the blood's clot-forming capacity, through destruction of the clot-forming part of the blood, known as prothrombin. Miss Oels got her somewhat reluctant rabbit to swallow doses of dicoumarol by using a stomach tube, which she introduced by means of a simple but effective device of her own invention. Then she extracted small measured samples of its blood from the large blood vessel in one of its ears, and measured the now much-retarded clotting time with a stop-watch.

The anti-clotting effect of dicoumarol can be offset with vitamin K; and this Miss Oels proceeded to administer, again taking blood samples and checking the restored clotting time with the stop-watch.

Miss Oels' ambition is a research career in either medicine or biochemistry. As a good start, she has won a place among the 40 winners of the Eighth Annual Science Talent Search, and is attending with them the five-day session of the Science

Talent Institute in Washington, D. C., March 3 through 7. At that time, recipients will be named for \$11,000 in Westinghouse Science Scholarships. The Science Talent Search is an annual event administered by Science Clubs of America and Science Service, with the support of the Westinghouse Educational Foundation.

Science News Letter, March 5, 1949

WILDLIFE

Desert Skunk Uses Cactus As Barbed-Wire Defense

► A SKUNK that used a kind of natural barbedwire entanglement for defense, instead of its own chemical-warfare weapon, is described in the JOURNAL OF MAMMALOGY (Feb.), by Charles A. Reed of the University of Arizona and William H. Carr of the Arizona Wildlife Federation.

The two zoologists were driving through the desert when a hooded skunk crossed the road. Because it had very little white on it they decided they wanted a closer look, so they stopped the car and got out.

The skunk was not enthusiastic about being interviewed, but instead of standing its ground and preparing for action it ran away. The zoologists followed. After a chase of a quarter of a mile, both pursuers and pursued were tired—temperature at ground level was about 90 degrees.

Suddenly the skunk started working its way into a tangle of dried joints of the cholla cactus, which is about the spiniest, "orneriest" plant that grows. In the midst of the tangle was the opening of a wood-rat's nest, directly under the cholla tree itself.

Into this the skunk dived. Out of the burrow's second entrance popped the scared wood-rat, which climbed into the thorny branches of the cholla tree. Eventually it came down and went into another of the burrow's many entrances. The skunk, however, stayed underground as long as the two men remained in the vicinity.

Science News Letter, March 5, 1949

Radar location ability is said to be possessed by *electric eels*; they have poor eyesight and live in murky waters but seem always to be able to locate their prey promptly.



Plastic Coasters and Tiles

EMBED REAL FLOWERS in NEW Magic PLASTIC

Now, create many unusual things like the distinctive pansy coaster shown—made by embedding real pansies in Castolite—the "magic" liquid plastic that "pours cold like honey . . . sets like glass" . . . at room temperature. Comes crystal clear or may be dyed for brilliant color effects. Embed other flowers, too, also coins, butterflies, medals, etc. Make really different jewelry, candlesticks, picture frames for gifts or to sell.

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BIOLOGY-BIOCHEMISTRY

Soviet Scientist Expected

► A RUSSIAN scientist whose theory of the origin of life on this planet has greatly influenced the thinking of biologists and biochemists in America and Europe will be one of the five delegates from the USSR to attend the Cultural and Scientific Conference for World Peace which will be held in New York March 25 through 27, under the auspices of the National Council of the Arts, Sciences and Professions.

He is Prof. A. I. Oparin, biochemist, of the Academy of Science of the USSR. His book, *THE ORIGIN OF LIFE*, was published in 1938 in English translation by the Macmillan Company. In it he endeavors to account for the evolution of life on the earth without recourse to such concepts as the migration of life-germs from "somewhere else" through interstellar space, or the existence of living matter along with non-living from the very beginning of things, or the sudden development under "special conditions" of such relatively complex things as bacteria.

Organic compounds originated on the cooling planet long before there were any organisms, according to Prof. Oparin's theory. He points to the known existence of such compounds as methane and ammonia on the major planets Jupiter and Saturn in support of this idea. In these compounds hydrogen is linked to carbon and nitrogen.

As other elements, notably oxygen, phosphorus and sulfur, became available, these spontaneously forming organic compounds could become more complex, forming larger molecules, until finally some that could fairly be called primary proteins were in existence. From these to the jelly-like state known as colloid was a natural, though very slowly-taken step. And finally, some of the colloid particles acquired enough "vital" processes to entitle them to be considered alive.

Spontaneous production of even the simplest organic compounds is unknown on earth today, Prof. Oparin admits. This is not necessarily because conditions for their formation are now impossible, however, but because if any such compounds came into existence at present, they would immediately be devoured and destroyed by the microorganisms that swarm everywhere.

Production of life in the laboratory, through human manipulation of this step-by-step buildup, is in Prof. Oparin's opinion not impossible, but for the present, and for a long time to come, highly improbable. We need to learn a great deal more about how living things are put together and how they work, before we shall be in position to attempt a modern realization of the medieval alchemist's dream of the homunculus, or life-in-a-bottle.

In its main outlines, Prof. Oparin's theory has been widely held by his scientific colleagues of other lands. His outstanding contribution has been the careful building up

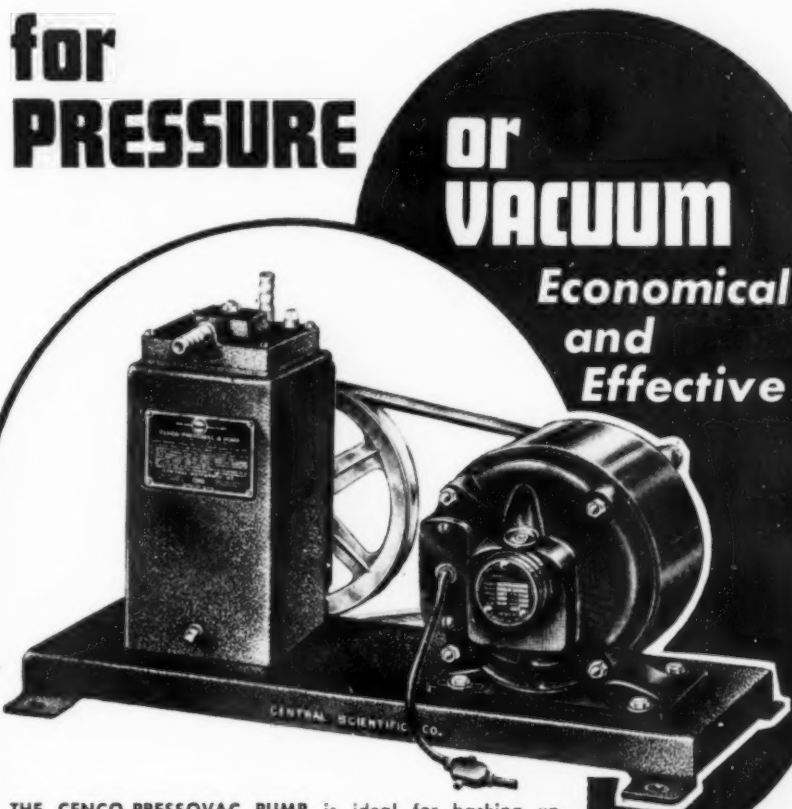
of the whole step-by-step structure and the filling in of many hitherto neglected details.

The five Soviet scientific and cultural representatives expected in March will be the first such group to visit this country since 1946, when nine Russian astronomers spent some time as guests of American ob-

servatories. Other members of the group will be the well known composer, Dmitri D. Shostakovich; A. A. Fadeef, a poet, T. Pavlenko, writer; and S. A. Gerasimov, a motion picture director and writer.

Science News Letter, March 5, 1949

Common folks of India will be able to get *radio programs* sponsored by the government by means of receiving sets and loud speakers being installed in many village centers.



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ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone



Stop 'Em Now!

► WINTER-WEARY folk, looking for the first robin, the first crocus, the first lilac leaves, are also likely to be greeted by other signs of spring that are not so welcome. Flies, for example.

The first few scouts of the fly hordes, that you see while outdoors is still chilly in the daytime and frosty at night, are most probably not new flies but old ones—hangers-on that have hidden away in attic crannies and other out-of-the-way nooks during the

winter, most of the time numbed into immobility by the cold but still managing to stay alive. Yet they are quite capable of propagating their evil kind, so now is the time to annihilate them, before they become too numerous to deal with by anything so elementary as a swatter. A swat in time now may save nine millions in July.

Appearance of these straggling advance guards should be sufficient warning to you to look to your anti-fly defenses while the season is yet young and before the main forces of the enemy arrive. Now is the time to get your screens out of storage, brush them off, and see if there are any fly-size leaks in them. Remember, it doesn't take much of a hole in a screen to let a fly through: their mesh is designed to be just about enough to stop a fly or an ordinary mosquito, so one or two broken or pushed-aside wires constitutes a practicable breach

in your fortress wall.

Unless your screens are of copper or other non-corroding metal, paint them. That will do much to insure continued security against the persistent enemies, who will be trying to sneak into your house as long as warm weather lasts. Do not mix DDT with your paint. This was an early recommendation that looked very promising for a time; but the very quality that makes paint good—a tight, tough, elastic outer film—is the wrong thing for DDT, because it seals it in and does not release it rapidly enough to do the flies any harm. The thing to do is paint your screens, then, after the paint has well dried, brush or spray them with a residual-type DDT preparation—there are plenty of the latter on the market now, each with its own merits, as the labels and advertising matter will not neglect to tell you.

Science News Letter, March 5, 1949

CONSERVATION

River Valley Conservation

► FULL conservation development of the river valleys of the world is essential if future generations are to have the necessities of life, Morris L. Cooke, Philadelphia management engineer, will tell the World Engineering Conference to be held this spring at Cairo.

In this paper, already transmitted for preliminary study, he characterized the present as a "time of wars of unprecedented violence, of waste and destruction beyond anything imagined by those who lived before us." Multiple-purpose river valley development is essential to make use of water power, prevent floods and erosion, and keep the land in the highest state of productivity.

"The tragedy of this historic period has washed not only over the world's men and women, but onto the earth from which they draw their sustenance," he continued. "A combination of erosion of the life-sustaining soil and floods, of predatory mining, grazing, lumbering, farming and industrial practices . . . has piled destruction on destruction until a rapidly growing world population must soberly contemplate a climax of starvation, want and death."

The development of the Tennessee Valley is an example of what he advocates, Mr. Cooke states. He pointed out that the Tennessee Valley work involves drastic decentralization and recognition of the watershed as a logical area for public administration, especially where the conservation and most effective use of soil and water are first considerations. He also referred to somewhat similar work in widely separated parts of the world.

The paper is for delivery at the Second International Technical Congress which will be held at Cairo at the invitation of the Egyptian government, March 20 to 26. Engineers from all parts of the world

will participate. The full paper is published in MECHANICAL ENGINEERING, official publication of the American Society of Mechanical Engineers.

Science News Letter, March 5, 1949

Science Service Radio

► LISTEN in to a discussion on "Far Below Zero" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST, Saturday, March 12. Dr. Elliott Montroll, head of the physics branch of the Office of Naval Research, and Larson M. McKenzie of the same branch, will be guests of Watson Davis, director of Science Service. At temperatures hundreds of degrees below zero, things behave strangely: metals lose their resistance to electricity and helium liquefied at slightly above the absolute zero of temperature turns out to be a most amazing substance. The guests will tell how industry and the Navy are making use of these strange phenomena.

Science News Letter, March 5, 1949

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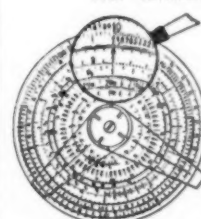
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Books of the Week

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ANALYSIS OF TEMPERATURE, PRESSURE AND DENSITY OF THE ATMOSPHERE EXTENDING TO EXTREME ALTITUDES—G. Grimmering—*Rand Corporation*, 149 p., illus., paper, \$2.85. A technical book prepared under sponsorship of the United States Air Force with important implications in connection with rocket and other very high altitude flight.

ANALYTIC GEOMETRY—Charles H. Sisam—*Holt*, rev. ed., 304 p., illus., \$2.40. Includes special exercises for superior students.

THE CHEMISTRY AND UTILIZATION OF BARK—*Northeastern Wood Utilization Council*, 133 p., paper, \$3.00. A group of papers concerned with the utilization of the millions of tons of bark now wasted or destroyed annually.

COLLEGE ALGEBRA—Edward A. Cameron and Edward T. Browne—*Holt*, 406 p., illus., \$3.00. For college freshmen.

COLLEGE GEOGRAPHY—Earl C. Case and Daniel R. Bergsma—*Wiley*, 3rd ed., 790 p., illus., \$5.00. Rewritten in the light of events since 1940. It also contains a new chapter on tropical and semi-tropical islands of the Pacific.

COMPONENTS HANDBOOK—John F. Blackburn, Ed.—*McGraw-Hill*, 626 p., illus., \$8.00. Principally of interest to the designer of receiving and testing electronic equipment.

THE DISPLACED PERSONS COMMISSION: Six Months of Operation—Ugo Carusi, Edward M. O'Connor, and Harry N. Rosenfield—*Govt. Printing Office*, 56 p., paper, 15 cents.

FIFTH SEMI-ANNUAL REPORT OF THE ATOMIC ENERGY COMMISSION—Atomic Energy Commission—*Govt. Printing Office*, 213 p., illus., paper, 45 cents.

THE FUNDAMENTALS OF COLLEGE CHEMISTRY—G. Brooks King and William E. Caldwell—*American*, 536 p., illus., \$4.00. Especially for students who do not plan to specialize in chemistry.

A HOME MADE WOOD BURNING FURNACE—*Northeastern Wood Utilization Council*, 11 p., illus., paper, 25 cents. Directions and drawings to enable you to build it.

THE HOSPITAL IN CONTEMPORARY LIFE—Nathaniel W. Faxon, Ed.—*Harvard University Press*, 288 p., illus., \$5.00. To give you an understanding of the organization and function of hospitals before you learn by being a patient in one.

THE ORIGIN OF GENIUS—Alfred Hock—*Alfred Hock*, 62 p., paper, \$1.80. A theoretical discussion based on a study of biographies, pathographies, diaries, memoirs, letters, confessions, and similar evidences of how the mind of a genius works. Translated from the German by John Gutman.

AN OUTLINE OF PSYCHOANALYSIS—Sigmund Freud—*Norton*, 127 p., \$2.00. An attempt by the famous author to state the doctrines of psychoanalysis in concise and dogmatic form rather than to present arguments for them. Hitherto unpublished in English.

PSYCHODYNAMICS AND THE ALLERGIC PATIENT—Harold A. Abramson—*Bruce Publishing Co.*,

81 p., illus., \$2.50. An official publication of the American College of Allergists.

QUIZ ON RAILROADS AND RAILROADING—*Association of American Railroads*, illus., paper, free on request to publishers at Transportation Building, Washington 6, D. C. A well illustrated booklet containing a great variety of information in question and answer form.

Science News Letter, March 5, 1949

ENTOMOLOGY

Sahara Desert Beetles Found South of Equator

➤ BEETLES of a kind hitherto known only from the Sahara and Gobi deserts have been found near the southwest coast of Africa by entomologists with the University of California Expedition. They constitute evidence of a time when the Sahara may have covered practically the whole of Africa, states Wendell Phillips, leader of the expedition, who is at present in this country.

The beetles belong to an ancient and primitive group known technically as the Calognathini, and have never before been reported from south of the equator. The 97 specimens now in the expedition's collections were captured by Dr. Karl Koch, an Austrian entomologist, and Dr. G. Van Son of the Transvaal Museum.

In all, the two entomologists have collected more than 10,000 specimens of insects, among which are over 100 new species of beetles.

Science News Letter, March 5, 1949

VETERINARY MEDICINE

Antimalarial Drug Found Effective for Fowl Disease

➤ A SYNTHETIC drug that was used during the war in combatting malarial and other human parasites has been found useful in the treatment of coccidiosis, one of the most destructive of the diseases that attack chickens, turkey and other fowl. Its name is mepacrine hydrochloride, and its new usefulness is reported in the British science journal, *Nature* (Feb. 12), by Dr. J. E. Wilson of the veterinary laboratory of the Ministry of Agriculture and Fisheries.

In one experiment, 80 ten-day-old chicks were infected with the organism of the disease. Forty of them were given the drug in their drinking-water, while the remaining 40, as a control group, received no medication. Twenty-six of the untreated control group died, as against only seven out of the 40 receiving the drug. Essentially similar results were obtained in a second experiment in which three-week-old chicks were used.

At present, the principal medications

used against fowl coccidiosis are some of the sulfonamides. Dr. Wilson suggests that since mepacrine hydrochloride treatment is easily used and comparatively inexpensive it may at least supplement the sulfa drugs, especially if strains of the disease organism resistant to sulfa action should develop.

Science News Letter, March 5, 1949

Word in Science— ANTU

➤ IN the course of an experiment on animals' sense of taste, the experimental rats died after eating what for other animals generally is a harmless substance. This unexpected result led to the discovery of the important new rat killer, ANTU. This is pronounced Ann-too, with the emphasis on Ann.

It is a very thorough killer, although if carefully used does not endanger pets or humans as do other potent poisons. Chemical name is alpha-naphthyl thiourea. It was one of the hush-hush military secrets during the war, and now promises to be an effective arm against world-wide hunger by reducing the enormous food consumption of rodents.

Science News Letter, March 5, 1949

A useful work of reference for all users of timber, containing detailed descriptions of nearly 200 different timbers, with microscopic identifications of the woods in more common use.

A Concise Encyclopedia of WORLD TIMBERS

By F. H. TITMUSS

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❁ **COMBINATION BAG**, a handbag when folded and a shopping bag when open, is made of water-proof plastic, and is arranged so that the lower half can be folded against the upper and fastened in place to form a neat, trim purse. It has an inside zipper pocket for bills and coins.

Science News Letter, March 5, 1949

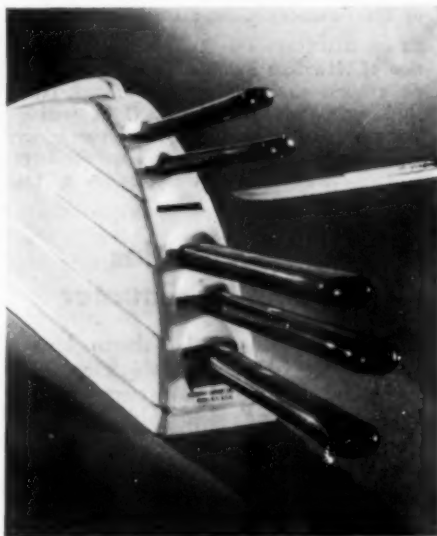
❁ **ALUMINUM WALL** tile, for household uses, is easily applied to any smooth wall with a water-proof mastic that holds it firmly so that it will not peel, crack or bulge. Usable in any room including the bath, it comes in various colors in a finish bonded and baked to the metal before sheets are cut to tile size.

Science News Letter, March 5, 1949

❁ **ELECTRIC SWITCH** for electric heating pads is operated by fingertip touch, not sight, with one button for low heat, a pair for medium, and a set of three for high heat. Reversing a tiny rotor cuts the current off.

Science News Letter, March 5, 1949

❁ **KNIFE HOLDER**, shown in the picture, has a series of slots for the various knives, within each of which is a sharpener that hones the blade whenever it is inserted or withdrawn. The casing is a chip-proof,



peel-proof, durable plastic which is made in various colors.

Science News Letter, March 5, 1949

❁ **ANTI-GLARE DEVICE**, recently patented, is for use of an automobile driver to shield his left eye from approaching headlights. Supported on the head by a band, the device has a translucent shield to the

left of the eye, and partially in front, so that by a slight turn of the head the glare is eliminated.

Science News Letter, March 5, 1949

❁ **TABLE, CONVERTIBLE** in height, has a center screw shaft like those used in office chairs and can be raised or lowered 10 inches. At its low height, it is an ideal coffee table, and when raised with leaves up it becomes a 30-inch square card or cocktail table.

Science News Letter, March 5, 1949

❁ **ENVELOPE ADDRESSER**, for use of church organizations or small business houses, requires no stencil or plate for each address, but uses only a master tape and a colorless fluid. It prints from carbon impressions typed on a long paper strip.

Science News Letter, March 5, 1949

❁ **ELECTRIC VIBRATOR**, strapped to the back of the hand, makes a "Swedish" massage possible in the home, given by any person after a little practice. The electrically driven device, usable with ordinary household current, makes possible the soothing, rubbing action required for muscle toning.

Science News Letter, March 5, 1949

Do You Know?

A fur farm, to be established in Tierra del Fuego, the island group beyond the southern tip of South America, will raise six kinds of foxes but will specialize in nutrias and mink.

Citrus molasses, also known as final syrup, is a by-product in processing citrus fruit products.

Acids from citrus fruits are used to give zip to soybean oil salad dressing.

Much of nature's *chemistry* in geological processes was carried out at high pressures and temperatures, not yet explored by man; when man does enter this high-pressure high-temperature field, he may have to rewrite much of the chemistry of today.

Bicarbonates and sulfates of calcium and magnesium, perhaps the most common causes of *hardness in water*, do not make the water injurious to health but they form insoluble compounds with soaps.

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